

varying the frequency of at least one of the frequency of the haptic effect and the frequency of the audio effect while maintaining substantially constant an average energy of the haptic effect.

**24.** The method of claim 23, wherein the frequency of the audio effect is varied while the frequency of the haptic effect is maintained substantially constant.

**25.** The method of claim 23, wherein outputting the haptic effect includes:

varying a frequency of pulses configured to cause the haptic effect to be output while inversely varying a magnitude of the pulses configured to output the haptic effect.

**26.** The method of claim 23, wherein the audio effect is configured to cause a user to perceive the haptic effect as having a perceived frequency different from the frequency of the haptic effect.

**27.** The method of claim 23, wherein the audio effect is configured to cause a user to perceive the haptic effect as having a perceived frequency different from the frequency of the haptic effect, the perceived frequency of the haptic effect being higher than the frequency of the haptic effect.

**28.** The method of claim 23, further comprising:

outputting a plurality of haptic effects, the plurality of haptic effects including the haptic effect, each haptic effect from the plurality of haptic effects having a different corresponding frequency, each corresponding frequency being within a frequency range from a plurality of frequency ranges.

**29.** A method, comprising:

receiving an output instruction; and

outputting a control signal based on the received output instruction, the control signal being configured to cause a haptic effect and an audio effect to be output substantially concurrently, the haptic effect having a frequency and the audio effect having a frequency different from the frequency of the haptic effect, the control signal being configured to vary at least one of the frequency of the haptic effect and the frequency of the audio effect while maintaining substantially constant an average energy of the haptic effect.

**30.** The method of claim 29, wherein the control signal is configured to cause the frequency of the audio effect to vary while causing the frequency of the haptic effect to remain substantially constant.

**31.** The method of claim 29, wherein the control signal includes a plurality of pulses, configured to cause a frequency of the plurality of pulses to vary while causing a magnitude of the plurality of pulses to vary inversely.

**32.** The method of claim 29, wherein the control signal is configured to cause a user to perceive the haptic effect as having a perceived frequency different from the frequency of the haptic effect.

**33.** The method of claim 29, wherein the control signal is configured to cause a user to perceive the haptic effect as having a perceived frequency different from the frequency of the haptic effect, the perceived frequency of the haptic effect being higher than the frequency of the haptic effect.

**34.** The method of claim 29, further comprising:

outputting a plurality of control signals including the control signal, the plurality of control signals being at least partially based on the received output instruction, each control signal from the plurality of control signals being uniquely associated with a frequency range from a plurality of frequency ranges, at least one control signal from the plurality of control signals being configured to cause the haptic effect.

**35.** The method of **29**, wherein the control signal is configured to output the haptic effect and the audio effect via an actuator of a haptic device.

**36.** The method of **29**, wherein the control signal is configured to output the haptic effect via an actuator of a haptic device, the control signal being configured to cause the audio effect to be output by an audio output device of the haptic device, the audio output device being substantially collocated with the actuator.

**37.** A method, comprising:

receiving an output instruction; and

outputting a control signal based on the received output instruction, the control signal being configured to cause a haptic effect and an audio effect to be output substantially concurrently via an actuator of a haptic device, the haptic effect having a frequency and the audio effect having a frequency different from the frequency of the haptic effect, the audio effect being configured to change a perceived frequency of the haptic effect.

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